

WHAT IS CLAIMED IS:

- 1 1. An audio processing method, comprising:
2 sequentially rendering audio summaries and transition audio segments
3 with at least one transition audio segment rendered between each pair of
4 sequential audio summaries, wherein each audio summary comprises digital
5 content summarizing at least a portion of a respective associated audio piece.
- 1 2. The method of claim 1, wherein identical transition audio segments
2 are rendered between pairs of sequential audio summaries.
- 1 3. The method of claim 2, wherein each identical transition audio
2 segment corresponds to a Gabor function in a time domain representation.
- 1 4. The method of claim 3, wherein each Gabor function has a center
2 frequency substantially corresponding to a center pitch of an adjacent audio
3 summary.
- 1 5. The method of claim 1, wherein the audio summaries and the
2 interleaved transition audio segments are rendered consecutively.
- 1 6. The method of claim 1, wherein each audio summary is a
2 representative segment of a respective associated audio piece.
- 1 7. The method of claim 1, further comprising classifying audio pieces
2 into categories in response to user input received during rendering of the
3 associated audio summaries.
- 1 8. The method of claim 7, further comprising building a playlist based
2 on categories assigned to a set of audio pieces.
- 1 9. The method of claim 1, wherein at least one audio summary is
2 linked to an associated audio piece.
- 1 10. The method of claim 9, further comprising rendering an audio piece
2 linked to an associated audio summary in response to user input received during
3 rendering of the associated audio summary.

1 11. The method of claim 1, further comprising rendering a given audio
2 piece beginning at a location in the given audio piece linked to an audio summary
3 associated with the given audio piece.

1 12. The method of claim 11, further comprising rendering a second
2 audio piece at a location in the second audio piece linked to a successive audio
3 summary associated with the second audio piece.

1 13. The method of claim 1, further comprising ordering audio
2 summaries in a sequence based on similarity to a given audio summary.

1 14. The method of claim 13, wherein audio summaries are rendered in
2 accordance with the ordered sequence.

1 15. The method of claim 1, wherein each audio piece is associated with
2 multiple audio summaries and a single audio summary is rendered automatically
3 for each audio piece, and further comprising rendering an audio summary for a
4 given audio piece in response to user input received during rendering of a
5 preceding audio summary associated with the given audio piece.

1 16. The method of claim 1, further comprising normalizing audio
2 summaries to a common loudness level.

1 17. An audio processing system, comprising:
2 a rendering engine operable to sequentially render audio summaries and
3 transition audio segments with at least one transition audio segment rendered
4 between each pair of sequential audio summaries.

1 18. A method of generating an annotated audio file, comprising:
2 annotating an original audio file by embedding therein information
3 enabling rendering of at least one audio summary contained in the annotated
4 audio file and comprising digital content summarizing at least a portion of the
5 original audio file.

1 19. The method of claim 18, wherein the rendering enabling
2 information is embedded in a header of the audio file.

1 20. The method of claim 19, wherein rendering enabling information
2 includes an audio summary embedded in the audio file header.

1 21. The method of claim 19, wherein rendering enabling information
2 embedded in the audio file header includes one or more pointers to one or more
3 respective locations in the original audio file.

1 22. The method of claim 18, wherein rendering enabling information is
2 embedded at different locations in the annotated audio file separated by audio
3 content of the original audio file.

1 23. The method of claim 22, wherein rendering enabling information
2 includes audio summaries embedded at different respective locations in the
3 annotated audio file separated by audio content of the original audio file.

1 24. The method of claim 22, wherein rendering enabling information
2 includes pointers to locations in the original audio file, the pointers being
3 embedded at different respective locations in the annotated audio file separated
4 by audio content of the original audio file.

1 25. The method of claim 18, wherein rendering enabling information
2 includes hierarchical information enabling rendering of audio summaries at
3 different levels of detail.

1 26. The method of claim 18, wherein at least one audio summary
2 corresponds to a representative sample of the original audio file.

1 27. The method of claim 18, wherein at least one audio summary
2 corresponds to audio content not contained in the original audio file.

1 28. The method of claim 18, wherein at least one audio summary
2 corresponds to one or more images representative of original audio file content.

1 29. The method of claim 18, wherein at least one audio summary
2 corresponds to digital textual content.

1 30. A software program for generating an annotated audio file, the
2 software program residing on a medium readable by an electronic device and
3 comprising instructions for causing an electronic device to:
4 annotate an original audio file by embedding therein information enabling
5 rendering of at least one audio summary contained in the annotated audio file and
6 comprising digital content summarizing at least a portion of the original audio
7 file.

1 31. A method of generating an annotated audio file, comprising:
2 annotating an original audio file by providing at least one browsable link
3 between the original audio file and at least one audio summary comprising digital
4 content summarizing at least a portion of the original audio file, and storing the
5 original audio file, the at least one browsable link, and the at least one audio
6 summary on a common portable storage medium.

1 32. A portable medium readable by an electronic device and tangibly
2 storing an original audio file, at least one audio summary comprising digital
3 content summarizing at least a portion of an original audio file, and at least one
4 browsable link between the original audio file and the at least one audio
5 summary.

1 33. A system for rendering an annotated video file, comprising:
2 a rendering engine operable to identify information embedded in the
3 annotated audio file and enabling rendering of at least one audio summary
4 contained in the annotated audio file and comprising digital content summarizing
5 at least a portion of the original audio file, and to operable to render the at least
6 one audio summary.

1 34. An audio processing method, comprising:
2 dividing an audio piece into audio segments;
3 extracting acoustical features from each audio segment;
4 grouping audio segments into clusters based on the extracted features;
5 identifying a representative audio segment in each cluster; and

6 selecting a representative audio segment as an audio summary of the audio
7 piece.

1 35. The method of claim 34, wherein each audio segment has a
2 substantially equal rendering time.

1 36. The method of claim 34, further comprising computing a feature
2 vector centroid for each cluster, wherein each representative audio segment is
3 closer to the feature vector centroid computed for the corresponding cluster than
4 all other audio segments in the corresponding cluster.

1 37. The method of claim 34, further comprising ranking clusters based
2 on respective numbers of audio segments in the clusters.

1 38. The method of claim 37, wherein a representative audio segment of
2 a highest ranked cluster is selected as the audio summary.